



NUCLEAR REGULATORY COMMISSION

10 CFR Part 61

[NRC-2017-0081]

RIN 3150-AK00

Greater-than-Class C and Transuranic Waste

AGENCY: Nuclear Regulatory Commission.

ACTION: Public meeting; request for comment.

SUMMARY: The U.S. Nuclear Regulatory Commission (NRC) is seeking stakeholder participation and involvement in identifying the various technical issues that should be considered in the development of a regulatory basis for the disposal of Greater-than-Class C (GTCC) and transuranic radioactive waste through means other than a deep geologic disposal, including near surface disposal. To assist in this process, the NRC is holding a public meeting and is requesting that stakeholders respond to the questions discussed in Section IV, "Specific Request for Comments," of this document.

DATES: Submit comments **by [INSERT DATE 60 DAYS AFTER DATE OF PUBLICATION IN THE *FEDERAL REGISTER*]**. Comments received after this date will be considered if it is practical to do so, but the NRC is only able to ensure consideration of comments received on or before this date.

ADDRESSES: You may submit comments by any of the following methods (unless this document describes a different method for submitting comments on a specific subject):

- **Federal Rulemaking Website:** Go to <https://www.regulations.gov> and search for Docket ID **NRC-2017-0081**. Address questions about NRC dockets to Carol Gallagher; telephone: 301-415-3463; e-mail: Carol.Gallagher@nrc.gov. For technical questions contact the individual(s) listed in the FOR FURTHER INFORMATION

CONTACT section of this document.

- **E-mail comments to:** Rulemaking.Comments@nrc.gov. If you do not receive an automatic e-mail reply confirming receipt, then contact us at 301-415-1677.

- **Fax comments to:** Secretary, U.S. Nuclear Regulatory Commission at 301-415-1101.

- **Mail comments to:** Secretary, U.S. Nuclear Regulatory Commission, Washington, DC 20555-0001, ATTN: Rulemakings and Adjudications Staff.

- **Hand deliver comments to:** 11555 Rockville Pike, Rockville, Maryland 20852, between 7:30 a.m. and 4:15 p.m. (EST) Federal workdays; telephone: 301-415-1677.

For additional direction on obtaining information and submitting comments, see “Obtaining Information and Submitting Comments” in the SUPPLEMENTARY INFORMATION section of this document.

FOR FURTHER INFORMATION CONTACT: Cardelia H. Maupin, Office of Nuclear Material Safety and Safeguards, U.S. Nuclear Regulatory Commission, Washington, DC 20555-0001; telephone: 301-415-4127; e-mail: Cardelia.Maupin@nrc.gov.

SUPPLEMENTARY INFORMATION:

I. Obtaining Information and Submitting Comments

A. Obtaining Information

Please refer to Docket ID **NRC-2017-0081** when contacting the NRC about the availability of information for this action. You may obtain publicly-available information related to this action by any of the following methods:

- **Federal Rulemaking Web site:** Go to <https://www.regulations.gov> and search for Docket ID **NRC-2017-0081**.

- **NRC's Agencywide Documents Access and Management System**

(ADAMS): You may obtain publicly-available documents online in the ADAMS Public Documents collection at <https://www.nrc.gov/reading-rm/adams.html>. To begin the search, select "[ADAMS Public Documents](#)" and then select "[Begin Web-based ADAMS Search](#)." For problems with ADAMS, please contact the NRC's Public Document Room (PDR) reference staff at 1-800-397-4209, 301-415-4737, or by e-mail to pdr.resource@nrc.gov.

- **NRC's PDR:** You may examine and purchase copies of public documents at the NRC's PDR, Room O1-F21, One White Flint North, 11555 Rockville Pike, Rockville, Maryland 20852.

B. Submitting Comments

Please include Docket ID **NRC-2017-0081** in the subject line of your comment submission, in order to ensure that the NRC is able to make your comment submission available to the public in this docket. If your comment contains proprietary or sensitive information, please contact the individual listed in the FOR INFORMATION CONTACT section of this document to determine the most appropriate method for submitting your comment.

The NRC cautions you not to include identifying or contact information that you do not want to be publicly disclosed in your comment submission. The NRC will post all comment submissions at <https://www.regulations.gov> as well as enter the comment submissions into ADAMS, and the NRC does not routinely edit comment submissions to remove identifying or contact information.

If you are requesting or aggregating comments from other persons for submission to the NRC, then you should inform those persons not to include identifying

or contact information that they do not want to be publicly disclosed in their comment submission. Your request should state that the NRC does not routinely edit comment submissions to remove such information before making the comment submissions available to the public or entering the comment into ADAMS.

II. Discussion

On December 22, 2015, the Commission, in Staff Requirements Memorandum (SRM)-SECY-15-0094, "Historical and Current Issues Related to Disposal of GTCC Low Level Radioactive Waste (LLRW)" (ADAMS Accession No. ML15356A623), directed the NRC staff to develop a regulatory basis for disposal of GTCC and transuranic waste through means other than a deep geologic disposal, including near surface disposal, within six months of the completion of the final rule for part 61 of title 10 of the *Code of Federal Regulations* (10 CFR), "Low-Level Radioactive Waste Disposal," RIN 3150-AI92; Docket ID NRC-2011-0012. The Commission also directed the staff to conduct a public workshop during the development of the regulatory basis to receive input from stakeholders. On September 8, 2017, the Commission, in SRM-SECY-16-0106, "Final Rule: Low-Level Radioactive Waste Disposal (10 CFR part 61) (RIN 3150-AI92)" (ADAMS Accession No. ML17251B147), revised its earlier directions regarding the development of the GTCC and transuranic waste regulatory basis. The Commission directed the staff to develop the regulatory basis six months after the publication of the supplemental proposed rule for the 10 CFR part 61 rulemaking.

The NRC staff is in the initial phase of implementing the Commission's directions in SRM-SECY-15-0094 and SRM-SECY-16-0106. The process of potentially amending the NRC's regulations is very thoughtful and deliberative because it can have significant impacts on members of the public, States, licensees, and other stakeholders. The

regulatory basis describes the various scientific, technical, and legal issues associated with a potential rulemaking. Therefore, as a part of the initial steps in implementing the Commission's directions, the staff has planned a public meeting with stakeholders to identify the various technical issues that should be considered in the development of a regulatory basis for the disposal of GTCC and transuranic waste. The staff is also requesting that stakeholders respond to the questions discussed in Section IV, "Specific Request for Comments," of this notice. When this initial phase is completed, staff plans to develop a regulatory basis, which will be provided for public review. Staff plans to hold public meetings on the draft regulatory basis as well. After which, the staff will develop a final regulatory basis.

III. Background

The NRC's "*Licensing Requirements for Land Disposal of Radioactive Waste*" are provided in 10 CFR part 61. Section 10 CFR 61.2, "*Definitions*," provides that waste as used in part 61 means those low-level radioactive wastes containing source, special nuclear, or byproduct material that are acceptable for disposal in a land disposal facility. The definition also indicates that low-level radioactive waste means radioactive waste not classified as high-level radioactive waste, transuranic waste, spent nuclear fuel, or byproduct material as defined in paragraphs (2), (3), and (4) of the definition of byproduct material in § 20.1003.

The Statements of Consideration (SOC) for the 10 CFR part 61 proposed rule explained that not all waste may be suitable for disposal in the near surface. Specifically, *Section IV Purpose and Scope* of the SOC (46 FR 38082; July 24, 1981) indicates that, while 10 CFR part 61 was intended to deal with the disposal of most LLRW defined by the Low-Level Radioactive Waste Policy Act, the 10 CFR part

61` waste classification system identified some LLRW that are not suitable for disposal under its regulatory framework, and alternative methods would have to be used.

In § 61.55, “*Waste classification*,” the NRC developed a classification system for waste for near surface disposal, which categorizes waste as Class A, B, or C. This provision also describes waste that is not generally acceptable for near-surface disposal, whose disposal methods must be more stringent than those specified for Class C waste. This waste is referred to as GTCC waste.

The GTCC waste is generated by nuclear power reactors, facilities supporting the nuclear fuel cycle, and other facilities and licensees outside of the nuclear fuel cycle. This class of wastes include (1) plutonium-contaminated nuclear fuel cycle wastes; (2) activated metals; (3) sealed sources; and (4) radioisotope product manufacturing wastes (i.e., wastes “occasionally generated as part of manufacture of sealed sources, radiopharmaceutical products and other materials used for industrial, education, and medical applications”).

With regards to transuranic waste, as mentioned earlier, transuranic waste is not included in the § 61.2 definition of LLRW. In a 1988 amendment to the Atomic Energy Act of 1954, as amended, a definition for transuranic was added. Transuranic waste¹ is defined as “material contaminated with elements that have an atomic number greater than 92, including neptunium, plutonium, americium, and curium, and that are in concentrations greater than 10 nanocuries per gram [(nCi/g)], or in such other concentrations as the [U.S.] Nuclear Regulatory Commission may prescribe to protect the public health and safety.” Transuranic waste is a byproduct of nuclear research and power production and is primarily produced from spent fuel recycling, medical isotope

¹ Defense waste containing more than 100 nCi of alpha emitting transuranic isotopes per gram of waste, with half-lives greater than 20 years can be disposed of at the Waste Isolation Pilot Plant.

production, or nuclear weapons fabrication. The waste may consist of rags, tools, and laboratory equipment contaminated with organic and inorganic residues.

The identification and evaluation of regulatory concerns associated with land disposal of GTCC and transuranic waste will largely depend on the characteristics of the wastes (e.g., isotopes, concentrations and volumes of waste, physical and chemical properties). The variable characteristics of the waste can influence the decision regarding the appropriate regulatory approach to use for management and disposal of these wastes. Overly conservative assumptions for the inventory and characteristics could significantly limit disposal options, whereas, overly optimistic assumptions with respect to characteristics could lead to a disposal facility that may not provide adequate protection of public health and safety, and security.

IV. Specific Request for Comment

The NRC is seeking stakeholder participation and involvement in identifying the various technical issues that should be considered in the development of a draft regulatory basis for the disposal of GTCC and transuranic radioactive waste through means other than a deep geologic disposal, including near surface disposal. To assist in this process, the NRC staff is requesting that stakeholders respond to the questions below. In addition, the NRC staff has conducted some initial technical analyses to assist its understanding of potential hazards with near surface disposal of GTCC and transuranic wastes, which are contained in draft "*NRC Staff Analyses Identifying Potential Issues Associated with the Disposal of Greater-Than-Class C Low-Level Radioactive Waste*," (ADAMS Accession No. ML17362A012). The draft analyses should assist in providing responses to the following questions:

Question 1: What are the important radionuclides that need to be considered for the disposal of the GTCC and transuranic wastes?

The U.S. Department of Energy has described three broad categories of GTCC wastes, including a range of transuranic radionuclides, in its “Final Environmental Impact Statement for the Disposal of Greater-Than-Class C (GTCC) Low-Level Radioactive Waste and GTCC-Like Waste” (<http://www.gtcceis.anl.gov/documents/index.cfm>). The three categories are entitled activated metals, sealed sources, and other wastes. The attributes (e.g., radionuclide concentrations, heat generation, and waste form) vary significantly between the three categories. Certain waste streams represent a very specific waste form (e.g., stainless steel for most activated metals; very concentrated amounts in sealed sources) that may require specific treatment to mitigate potential safety, security and criticality concerns. Some waste streams may contain sufficient quantities of specific radionuclides that will present a significant thermal output and/or gas generation through radiolysis. Still other waste streams may contain a significant quantity of fissile radionuclides (e.g., some isotopes of uranium and plutonium). The NRC is interested in identifying those radionuclides that could be important for evaluating the safety and security of: (1) Storage associated with the operational period at a disposal facility, and (2) the post-closure period, including inadvertent intruder protection. Additionally, the NRC is interested in obtaining available data and information to support the characteristics of GTCC and transuranic wastes.

Question 2: How might GTCC and transuranic wastes affect the safety and security of a disposal facility during operations (i.e., pre-closure period)?

The presence of sufficient quantities of high activity radionuclides and/or fissile radionuclides in GTCC and transuranic wastes may impact the design and operational activities associated with a disposal facility prior to disposal. The NRC is interested in

identifying those design and operational activities at a disposal facility that may be impacted by GTCC and transuranic wastes. For example, the requirements in 10 CFR part 73 would require licensees to develop safeguards systems to protect against acts of radiological sabotage and to prevent the theft or diversion of Special Nuclear Material (i.e., transuranic waste such as plutonium, uranium-233, or uranium enriched in the isotopes uranium-233 or uranium-235) if a sufficient amount of Special Nuclear Material were present above ground at the disposal facility.

Question 3: How might GTCC and transuranic wastes affect disposal facility design for post-closure safety including protection of an inadvertent intruder?

The NRC is considering disposal units (e.g., a single trench, borehole, and vault) that would contain a single category of waste (e.g., sealed sources) as well as disposal units that contain a mixture of all three waste types. However, the NRC believes the best approach for understanding the issues would be to assume that waste within a disposal unit would be separated by the waste category and not be co-mingled. Such an approach could provide a clear understanding of the issues associated with how a specific waste category might affect disposal facility design. Certain waste streams associated with GTCC and transuranic wastes have larger inventories and concentrations of radionuclides than was typically considered at LLRW disposal facilities. For example, certain GTCC and transuranic wastes in sufficient quantities have the potential for: (1) Significant thermal output that could affect degradation processes within a disposal unit, and (2) hydrogen gas generation through radiolysis that could also affect degradation processes of the waste package and waste form. Additionally, waste streams associated with GTCC and transuranic wastes may have fissile materials that require facilities to be designed to limit the potential for a criticality event or limit the amount of fissile material that can be disposed. There is a potential

balance between security/safety and economic feasibility of design, construction, and operation. The NRC would like to hear from the stakeholders on these aspects as well. The information provided on economic feasibility would be in concert with the NRC's strategies on examining the cumulative effects of potential regulatory actions. The NRC is interested in identifying the various scenarios that should be considered in evaluating the post-closure safety for the disposal of GTCC and transuranic wastes especially scenarios associated with specific issues and concerns that may not have been previously considered for commercial disposal facilities (e.g., synergistic effects of the thermal output on geochemical processes affecting release of radionuclides).

V. Public Meeting

To facilitate the understanding of the public and other stakeholders of these issues and the submission of comments, the NRC staff has scheduled a public meeting for February 22, 2018, from 1:00 p.m. to 3:00 p.m. (EST) in the NRC Auditorium at 11545 Rockville, Pike, Rockville, MD. In addition, those wishing to participate by Webinar will be able to view the presentation slides prepared by the NRC and electronically submit comments during the meeting. Participants must register to participate in the Webinar. Registration information may be found in the meeting notice (<https://www.nrc.gov/pmns/mtg?do=details&Code=20180033>). The meeting notice can also be accessed through the NRC's public Web site under the headings Public Meetings & Involvement > Public Meeting Schedule; see Web page <https://www.nrc.gov/public-involve/publicmeetings/index.cfm>.

Additionally, the final agenda for the public meeting will be posted no fewer than 10 days prior to the Webinar at this Website. Those who are unable to participate in person or via Webinar may also participate via teleconference. For details on how to

participate via teleconference, please contact Sarah Achten; telephone: 301-415-6009;
e-mail: Sarah.Achten@nrc.gov.

Dated at Rockville, Maryland, this day of February 9, 2018.

For the Nuclear Regulatory Commission

Gregory F. Suber,

Acting Deputy Director,

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